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THE PREROGATIVES OF A STATE GEOLOGIST.

IT was with surprise that I noticed in a recent number of SCIENCE a communication on the 'Prerogatives of a State Geologist,' in which I am made the target of considerable unfair criticism. The temerity of its author, Mr. Erasmus Haworth, in distorting facts is not only a little astonishing, but smacks almost of deliberate endeavor to misrepresentation. Ordinarily it would not demand the slightest notice, but from the character of the presentation there might appear some plausibility to some of those who have no personal knowledge of the circumstances, of the animus of assault, or of the persons involved. I do not care to impose, even upon an indulgent public, an account of the various differences which have recently arisen between Mr. Haworth and myself. I only wish to make the statement, and that emphatically, that the charges made are either wholly false or are calculated to deceive. With the same data and by the same adroit manipulation of phrases and partial quotation it can be proved to the full satisfaction of the sunflower savant that the moon is made of green cheese.

CHARLES R. KEYES.

COIN DISTORTIONS BY RÖNTGEN RAYS.

WE have repeated Professor Frost's interesting experiments on the distortion of coins (SCIENCE, N. S., Vol. III., No. 65, p. 465) in skiagraphs, but we have come to the conclusion that the distortion is due, not to electrostatic charges (as was suggested in the article referred to), but simply to umbras and penumbras formed by rays emanating from different points and falling upon coins of different thicknesses. In repeating Prof. Frost's experiments, we had the Crookes tube 14 mm. above the silver dollar and the film 3 mm. below the coins. We then placed the coins on a horizontal pane of glass and in the same position relative to the Crookes tube above them as when the skiagraph was taken. On holding a piece of paper up against the pane and examining by the eye, from below, the shadow cast by the coins in the light of the Crookes tube above, the very same distortion was seen that was shown in the skiagraph.

With the view of preventing X-rays having a large incident angle from striking the edges of the coins forming the curvilinear triangle, we placed upon the triangle a cylindrical section cut from the neck of a yellow-glass bottle. The section was ground down to a height of 11 mm., its internal diameter varied from 13 to 15 mm., its thickness was 5 mm. The distortion in the skiagraph was a trifle less than formerly, but more pronounced, we thought, than in the ocular test.

Fearing that the glass was somewhat transparent to X-rays, we replaced it by three iron washers superposed upon each other. Their internal and external diameters were 14 mm. and 34 mm. respectively, and their combined thickness was 9 mm. The tube, film and coins were in the same relative position as before. The skiagraph revealed much less distortion than in the first exposure. The ocular test with the washers on and with them off produced, as nearly as we could tell, exactly the same effects as were shown in the skiagraphs.

In another trial we discarded the washers and separated the coins from the film by only three thicknesses of black paper. The tube was again 14 mm. above the coins. As expected, the edges of the coins in the skiagraph were very sharp, and there was no trace of distortion. In this case the electrostatic charges must have been fully as pronounced as in the first experiment, but a perceptible penumbra could not have been formed. It would seem, therefore, that the distortion was due simply to umbras and penumbras cast by the coins.

FLORIAN CAJORI,
WILLIAM STRIEBY.

COLORADO COLLEGE,
April 10, 1896.

SCIENTIFIC LITERATURE.

THE ERUPTIVE SEQUENCE.

Die Eruptivgesteine des Kristianiagebietes II. Die Eruptionsfolge der triadischen Eruptivgesteine bei Predazzo in Südtirol. Von DR. W. C. BRÖGGER. Videnskabselskabets Skrifter, I. Mathematisk-Naturv. Klasse. 1895, No. 7. Kristiania.
After many years of exhaustive research